

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
4 January 2001 (04.01.2001)

PCT

(10) International Publication Number
WO 01/00231 A3(51) International Patent Classification: A61K 39/39,
A61P 33/06 // (A61K 39/39, 39:005)(74) Agent: TYRRELL, Arthur, William, Russell; SmithK-
line Beecham, Corporate Intellectual Property, Two New
Horizons Court, Brentford, Middlesex TW8 9EP (GB).

(21) International Application Number: PCT/EP00/05841

(22) International Filing Date: 23 June 2000 (23.06.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
9915204.3 29 June 1999 (29.06.1999) GB(71) Applicant (for all designated States except US):
SMITHKLINE BEECHAM BIOLOGICALS S.A.
[BE/BE]; Rue de L'Institut 89, B-1330 Rixensart (BE).(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ,
DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,
TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG,
CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).**Published:**

— With international search report.

(88) Date of publication of the international search report:
5 July 2001For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(72) Inventors; and

(75) Inventors/Applicants (for US only): COHEN, Joseph
[US/BE]; SmithKline Beecham Biologicals S.A., Rue de
l'Institut 89, B-1330 Rixensart (BE). GARCON, Nathalie
[FR/BE]; SmithKline Beecham Biologicals S.A., Rue
de l'Institut 89, B-1330 Rixensart (BE). VOSS, Gerald
[DE/BE]; SmithKline Beecham Biologicals S.A., Rue de
l'Institut 89, B-1330 Rixensart (BE).

(54) Title: USE OF CPG AS AN ADJUVANT FOR MALARIA VACCINE

(57) Abstract: A vaccine formulation for the prevention or amelioration of plasmodium infection in humans is provided. The vaccine comprises a malaria antigen, especially a protein which comprises a portion of the CS protein of *P. falciparum* fused in frame via a linear linker to the N-terminal of HBsAg, and an immunostimulatory CpG oligonucleotide. Methods for making the vaccine formulation of the invention are described. Patients may also be treated by pre-administration of the CpG oligonucleotide prior to administration of the malaria antigen.

WO 01/00231 A3